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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/754,486	01/03/2001	Stephen Temple	27754/X254A	4903
4743 7590 01/11/2008 MARSHALL, GERSTEIN & BORUN LLP 233 S. WACKER DRIVE, SUITE 6300 SEARS TOWER CHICAGO, IL 60606			EXAMINER DANIELS, MATTHEW J	
			ART UNIT 1791	PAPER NUMBER
			MAIL DATE 01/11/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 09/754,486	<b>Applicant(s)</b> TEMPLE ET AL.	
	<b>Examiner</b> MATTHEW J. DANIELS	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 9,23-25,31 and 34-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 9 and 34-37 is/are allowed.
- 6) ☐ Claim(s) 23-25,31 and 38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 30 October 2007 has been entered.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 23, 24, 31, and 38** rejected under 35 U.S.C. 103(a) as being unpatentable over Shei (USPN 5569238) in view of Turner (GB 2262253). **As to Claims 23 and 31**, Shei teaches a method of laser cutting or ablating which comprises:

(a) Directing a high energy beam having a first axis extending in a first direction towards the substrate (Fig. 2)

(b) Directing the beam at first, second, and third reflecting surfaces, wherein the inversion and direction along an axis collinear with the first axis would have been obvious (Fig. 2)

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Shei appears to be silent to the forming of a hole having one orifice larger than the other which could be used as an ink jet nozzle and the rotation of the assembly containing the reflecting surfaces.

However, Turner teaches that it is conventional to etch a “divergent hole” in a substrate (Abstract), which could inherently act as an ink jet nozzle, by rotating a beam which has been reflected of first, second, and third reflecting surfaces (arrow in Fig. 4).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Turner into that of Shei in order to perform laser drilling in locations where the undersurface is inaccessible but require a taper (Turner, Page 2). The combination provides generally the ability to vary the shape of the drilled hole.

**As to Claim 24**, in the method of Shei, each of the reflecting surfaces each comprises a discrete member (Fig. 2).

**As to Claim 38**, Shei teaches a method of laser cutting or ablating which comprises:

- (a) Directing a high energy beam having a first axis extending in a first direction towards the substrate (Fig. 2), introduction of divergence and convergence into the beam (Fig. 9), and use of a mask to shape the beam (Fig. 2, items 115, 120), in process steps that appear to be conventional in the art
- (b) Directing the beam at first, second, and third reflecting surfaces, wherein the inversion and direction along an axis collinear with the first axis would have been obvious (Fig. 2). The surfaces would obviously be fixed during operation.

Shei appears to be silent to the forming of a hole having one orifice larger than the other which could be used as an ink jet nozzle and the rotation of the assembly containing the reflecting surfaces.

However, Turner teaches that it is conventional to etch a “divergent hole” in a substrate (Abstract), which could inherently act as an ink jet nozzle, by rotating a beam which has been reflected of first, second, and third reflecting surfaces (arrow in Fig. 4).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Turner into that of Shei in order to perform laser drilling in locations where the undersurface is inaccessible but require a taper (Turner, Page 2). The combination provides generally the ability to vary the shape of the drilled hole.

3. **Claim 25** is rejected under 35 U.S.C. 103(a) as being unpatentable over Shei (USPN 5569238) in view of Turner (GB 2262253), and further in view of Daly (US Patent No. 4,316,074). Shei and Turner teach the subject matter of Claims 23 and 24 above under 35 USC 103(a).

Shei and Turner do not specifically teach the high reflectance dielectric mirrors. However, Daly ('074) teaches the use of high reflectance dielectric mirrors (see col. 6, lines 30-35). It would have been obvious for one of ordinary skill in the art to have used the high reflectance dielectric mirrors of Daly ('074) in the process of Shei because Daly ('074) teaches that such mirrors have a 99% reflectance rate, whereas the process of Shei requires reflective means for homogenizing the beam, hence improving process quality and efficiency through its high degree of reflectance.

***Allowable Subject Matter***

4. Claims 9 and 34-37 are allowed.

***Response to Arguments***

5. Applicant's arguments pertaining to the interchangeability of the Shei and Nishikawa devices as functional equivalents on pages 9-10 of the 30 October 2007 reply are persuasive. The argument is generally that the devices are equivalents, and while they may be interchangeable, there is no reason or motivation to combine them. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shei in view of Turner.

6. Claims 23, 24, 25, 38, and particularly 31 are sufficiently broad so as to read on the process or device of Shei taken in combination with Turner. The use of the three reflecting surfaces, as these references indicate, is conventional. The argument with respect to the combination of Shei and Nishikawa has no bearing on these claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. DANIELS whose telephone number is (571)272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Matthew J. Daniels

A.U. 1791  
7 January 2008